

# **Aalborg Universitet**

# Fragile-to-strong transition in metallic glass-forming liquids

An invited talk

Hu, L. N.; Zhang, C. Z.; Yue, Yuanzheng; Mauro, J. C.

Publication date:

Document Version Early version, also known as pre-print

Link to publication from Aalborg University

Citation for published version (APA):

Hu, L. N., Zhang, C. Z., Yue, Y., & Mauro, J. C. (2011). *Fragile-to-strong transition in metallic glass-forming liquids: An invited talk*. Abstract from 5th International Workshop on Flow and Fracture of Advanced Glasses, St-Malo, France.

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
  You may freely distribute the URL identifying the publication in the public portal -

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

# Fragile-to-strong transition in metallic glass-forming liquids

Chunzhi Zhang<sup>1</sup>, Lina Hu<sup>1</sup>, Yuanzheng Yue<sup>1,2</sup>, and John C. Mauro<sup>3</sup>

<sup>1</sup>Laboratory of Liquid Structure, Shandong University, Jinan 250061, China <sup>2</sup>Section of Chemistry, Aalborg University, DK-9000 Aalborg, Denmark <sup>3</sup>Science and Technology Division, Corning Incorporated, Corning, New York, USA

## **Abstract**

Two of the earth's most abundant substances, water and silica, exhibit some of the most unusual properties in nature. Among these is an anomalous scaling of liquid dynamics, which appear non-Arrhenius (or "fragile") at high temperatures yet Arrhenius (or "strong") at low temperatures. Here we show that this fragile-to-strong (F-S) transition is not limited to a few liquids like water and silica, but is possibly a general behaviour of metallic glass-forming liquids (MGFLs). We also propose a general model for the viscosity of F-S liquids that captures the scaling of dynamics across both the fragile and strong regimes.